

**Water Quality Assessment
the North Fork of the Gunnison River
Town of Hotchkiss WWTF**

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I. Water Quality Assessment Summary

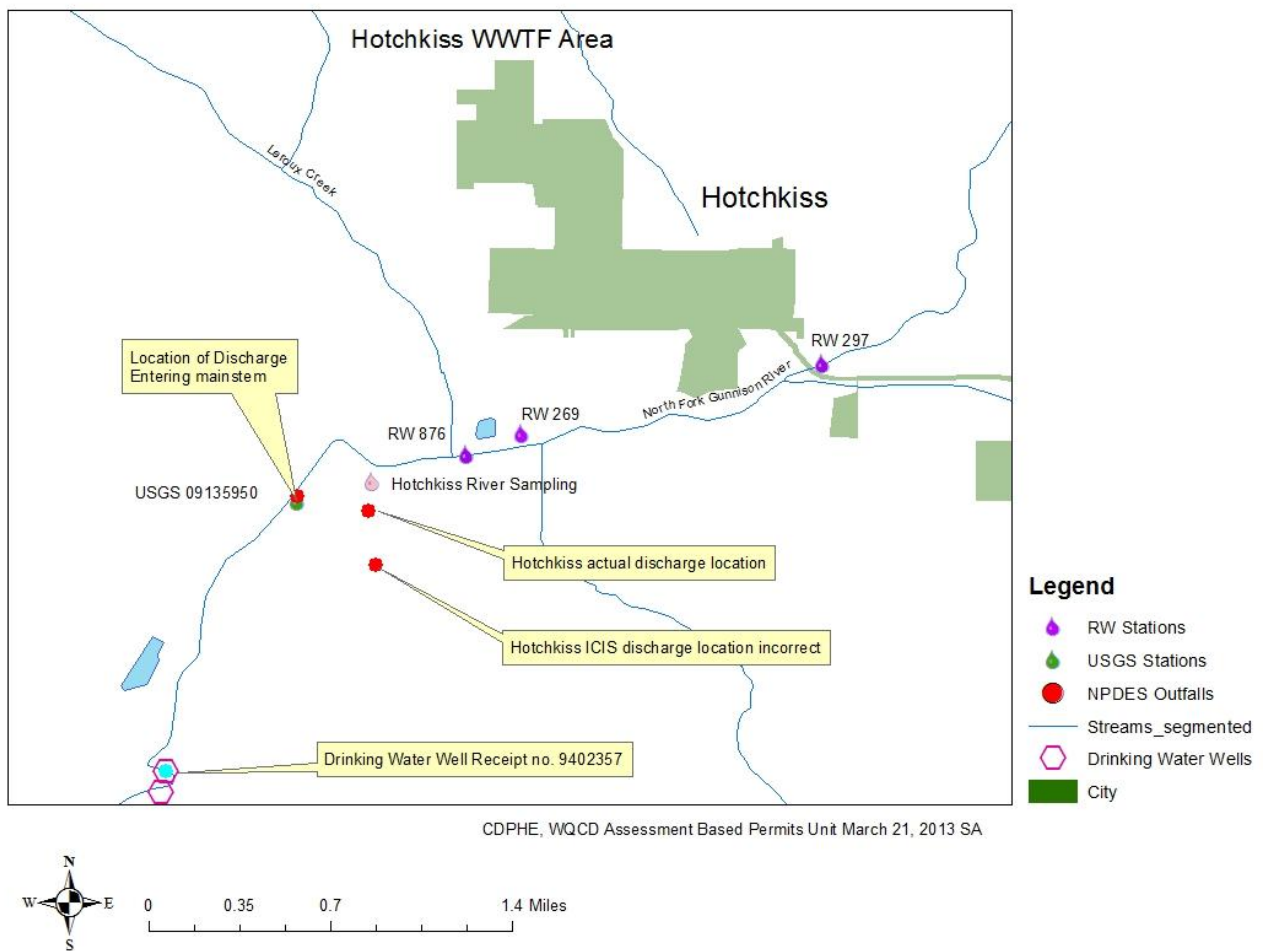
Table A-1 includes summary information related to this Water Quality Assessment (WQA). This summary table includes key regulatory starting points used in development of the WQA such as: receiving stream information; threatened and endangered species; 303(d) and Monitoring and Evaluation listings; low flow and facility flow summaries; and a list of parameters evaluated.

Table A-1 WQA Summary					
Facility Information					
Facility Name		Permit Number	Design Flow (max 30-day ave, MGD)	Design Flow (max 30-day ave, CFS)	
F1. Town of Hotchkiss WWTF		CO0044903	0.494	0.76	
F2. Town of Paonia WWTF		CO0047431	0.495	0.77	
Receiving Stream Information					
Receiving Stream Name		Segment ID	Designation	Classification(s)	
S1. the North Fork of the Gunnison River		COGUNF03	Undesignated	Aquatic Life Cold 1 Recreation P (October 1 to March 31) Recreation E (April 1 to September 30) Agriculture Water Supply	
Low Flows (cfs)					
1E3 (1-day)		7E3 (7-day)	30E3 (30-day)	Ratio of 30E3 to the Design Flow	
S1. 22		25	29	38:1	
Regulatory Information					
T&E Species	303(d) (Reg 93)	Monitor and Eval (Reg 93)	Existing TMDL	Temporary Modification(s)	Control Regulation
No	None currently	None currently	Yes Feb. 14, 2011 Se	None	Regulation No. 39 Salinity
Pollutants Evaluated					
F1: Ammonia, <i>E. Coli</i> , TRC, Se, Temp, Nitrate; F2: Ammonia					

II. Introduction

The WQA of the North Fork of the Gunnison River near the Town of Hotchkiss Waste Water Treatment Facility (WWTF), located in Delta County, is intended to determine the assimilative capacities available for pollutants found to be of concern. This WQA describes how the water quality based effluent limits (WQBELs) are developed. These parameters may or may not appear in the permit with limitations or monitoring requirements, subject to other determinations such as reasonable potential analysis, evaluation of federal effluent limitation guidelines, implementation of state-based technology based limits, mixing zone analyses, 303(d) listings, threatened and endangered species listing, or other requirements as discussed in the permit rationale. Figure A-1 contains a map of the study area evaluated as part of this WQA.

FIGURE A-1



The Hotchkiss WWTF discharges to the North Fork of the Gunnison River, which is stream segment COGUNF03. This means the Gunnison River Basin, North Fork of Gunnison River Sub-basin, Stream Segment 03. This segment is composed of the “Mainstem of North Fork of the Gunnison River from the Black Bridge (41.75 Drive) above Paonia to the confluence with the Gunnison River.” Stream segment COGUNF03 is classified for Aquatic Life Cold 1, Recreation P (October 1 to March 31), Recreation E (April 1 to September 30), Water Supply and Agriculture.

This segment was included on the 2008 Colorado 303(d) List of Impaired Waters for Selenium (Se) requiring development of a Total Maximum Daily Load (TMDL) for Se. A TMDL was submitted and approved by the U.S. Environmental Protection Agency (EPA) on February 14, 2011.

Information used in this assessment includes data gathered from the Hotchkiss WWTF, the Colorado Water Quality Control Division (Division), the Colorado Division of Water Resources (DWR), Riverwatch, the U.S. Geological Survey (USGS) and communications with the local water commissioner. The data used in the assessment consist of the best information available at the time of preparation of this WQA analysis.

III. Water Quality Standards

Narrative Standards

Narrative Statewide Basic Standards have been developed in Section 31.11(1) of the regulations, and apply to any pollutant of concern, even where there is no numeric standard for that pollutant. Waters of the state shall be free from substances attributable to human-caused point source or nonpoint source discharges in amounts, concentrations or combinations which:

for all surface waters except wetlands;

(i) can settle to form bottom deposits detrimental to the beneficial uses. Depositions are stream bottom buildup of materials which include but are not limited to anaerobic sludge, mine slurry or tailings, silt, or mud; or (ii) form floating debris, scum, or other surface materials sufficient to harm existing beneficial uses; or (iii) produce color, odor, or other conditions in such a degree as to create a nuisance or harm existing beneficial uses or impart any undesirable taste to significant edible aquatic species or to the water; or (iv) are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life; or (v) produce a predominance of undesirable aquatic life; or (vi) cause a film on the surface or produce a deposit on shorelines; and

for surface waters in wetlands;

(i) produce color, odor, changes in pH, or other conditions in such a degree as to create a nuisance or harm water quality dependent functions or impart any undesirable taste to significant edible aquatic species of the wetland; or (ii) are toxic to humans, animals, plants, or aquatic life of the wetland.

In order to protect the Basic Standards in waters of the state, effluent limitations and/or monitoring requirements for any parameter of concern could be put in Colorado Discharge Permit System (CDPS) discharge permits.

Standards for Organic Parameters and Radionuclides

Radionuclides: Statewide Basic Standards have been developed in Section 31.11(2) and (3) of The Basic Standards and Methodologies for Surface Water to protect the waters of the state from radionuclides and organic chemicals.

In no case shall radioactive materials in surface waters be increased by any cause attributable to municipal, industrial, or agricultural practices or discharges to as to exceed the following levels, unless alternative site-specific standards have been adopted. Standards for radionuclides are shown in Table A-2.

Table A-2 Radionuclide Standards	
Parameter	Picocuries per Liter
Americium 241*	0.15
Cesium 134	80
Plutonium 239, and 240*	0.15
Radium 226 and 228*	5
Strontium 90*	8
Thorium 230 and 232*	60
Tritium	20,000

*Radionuclide samples for these materials should be analyzed using unfiltered (total) samples. These Human Health based standards are 30-day average values for both plutonium and americium.

Organics: The organic pollutant standards contained in the Basic Standards for Organic Chemicals Table are applicable to all surface waters of the state for the corresponding use classifications, unless alternative site-specific standards have been adopted. These standards have been adopted as “interim standards” and will remain in effect until alternative permanent standards are adopted by the Water Quality Control Commission (Commission). These interim standards shall not be considered final or permanent standards subject to antibacksliding or downgrading restrictions. Although not reproduced in this WQA, the specific standards for organic chemicals can be found in Regulation 31.11(3).

In order to protect the Basic Standards in waters of the state, effluent limitations and/or monitoring requirements for radionuclides, organics, or any other parameter of concern could be put in CDPS discharge permits.

The aquatic life standards for organics apply to all stream segments that are classified for aquatic life. The water supply standards apply only to those segments that are classified for water supply. The water + fish standards apply to those segments that have a Class 1 aquatic life and a water supply classification. The fish ingestion standards apply to Class 1 aquatic life segments that do not have a water supply designation. The water + fish and the fish ingestion standards may also apply to

Class 2 aquatic life segments, where the Water Quality Control Commission has made such determination.

Because the the North Fork of the Gunnison River is classified for Aquatic Life Cold 1, with a water supply designation, the water + fish and aquatic life standards apply to this discharge.

Salinity

Salinity: Regulation 61.8(2)(l) contains requirements regarding salinity for any discharges to the Colorado River Watershed. For industrial dischargers and for the discharge of intercepted groundwater, this is a no-salt discharge requirement. However, the regulation states that this requirement may be waived where the salt load reaching the mainstem of the Colorado River is less than 1 ton per day, or less than 350 tons per year. The Division may permit the discharge of salt upon a satisfactory demonstration that it is not practicable to prevent the discharge of all salt. See Regulation 61.8(2)(l)(i)(A)(1) for industrial discharges and 61.8(2)(l)(iii) for discharges of intercepted groundwater for more information regarding this demonstration.

For municipal dischargers, an incremental increase of 400 mg/l above the flow weighted averaged salinity of the intake water supply is allowed. This may be waived where the salt load reaching the mainstem of the Colorado River is less than 1 ton per day, or less than 366 tons per year. The Division may permit the discharge of salt in excess of the 400 mg/l incremental increase, upon a satisfactory demonstration that it is not practicable to attain this limit. See Regulation 61.8(2)(l)(vi)(A)(1) for more information regarding this demonstration.

In addition, the Division's policy, Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops, may be applied to discharges where an agricultural water intake exists downstream of a discharge point. Limitations for electrical conductivity and sodium absorption ratio may be applied in accordance with this policy.

Temperature

Temperature shall maintain a normal pattern of diurnal and seasonal fluctuations with no abrupt changes and shall have no increase in temperature of a magnitude, rate, and duration deemed deleterious to the resident aquatic life. This standard shall not be interpreted or applied in a manner inconsistent with section 25-8-104, C.R.S.

Segment Specific Numeric Standards

Numeric standards are developed on a basin-specific basis and are adopted for particular stream segments by the Commission. The standards in Table A-3 have been assigned to stream segment COGUNF03 in accordance with the *Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins*.

The Commission has recently completed a final action concerning the *Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins*. The recent changes that become effective March 31, 2013 will change the applicable standards for stream segment COGUNF03. These changes include seasonal recreation classifications and standards of Recreation E or 'existing

recreation' from April 1 to September 30 with an associated standard of 126/100ml, and Recreation P or 'potential recreation' from October 1 to March 31 with a standard of 205/100ml. Additional changes included the addition of the Water Supply classification and associated standards, the addition of a numeric temperature standard, and the deletion of the Se temporary modification due to expire on March 31, 2013.

This WQA has been developed in conformance with the water quality standards that became effective on March 31, 2013, as any permitting action based on this WQA would take effect immediately after the effective date of this regulation.

Table A-3
In-stream Standards for Stream Segment COGUNF03
<i>Physical and Biological</i>
Dissolved Oxygen (DO) = 6 mg/l, minimum (7 mg/l, minimum during spawning)
pH = 6.5 - 9 su
<i>E. coli</i> chronic = 126 colonies/100 ml (April 1 to Sep 30); 630 colonies/100 ml (Oct 1 to Mar 31)
Temperature April-Oct = 18.3° C MWAT and 23.9° C DM
Temperature Nov-March = 9° C MWAT and 13° C DM
<i>Inorganic</i>
Total Ammonia acute and chronic = TVS
Chlorine acute = 0.019 mg/l
Chlorine chronic = 0.011 mg/l
Free Cyanide acute = 0.005 mg/l
Sulfide chronic = 0.002 mg/l
Boron chronic = 0.75 mg/l
Nitrite acute = 0.05 mg/l
Nitrate acute = 10 mg/l
Chloride chronic = 250 mg/l
Sulfate chronic = For WS, the greater of ambient water quality as of January 1, 2000 or 250 mg/l
<i>Metals</i>
Dissolved Arsenic acute = 340 µg/l
Total Recoverable Arsenic chronic = 0.02 µg/l
Dissolved Cadmium acute for trout and Dissolved Cadmium chronic = TVS
Total Recoverable Trivalent Chromium acute = 50 µg/l
Dissolved Trivalent Chromium chronic = TVS
Dissolved Hexavalent Chromium acute and chronic = TVS
Dissolved Copper acute and chronic = TVS
Dissolved Iron chronic = For WS, the greater of ambient water quality as of January 1, 2000, or 300 µg/l
Total Recoverable Iron chronic = 1000 µg/l
Dissolved Lead acute and chronic = TVS
Dissolved Manganese chronic = For WS, the greater of ambient water quality as of January 1, 2000, or 50 µg/l
Dissolved Manganese acute and chronic = TVS
Total Recoverable Molybdenum chronic = 160 µg/l
Total Mercury chronic = 0.01 µg/l
Dissolved Nickel acute and chronic = TVS
Dissolved Selenium acute and chronic = TVS
Dissolved Silver acute and Dissolved Silver chronic for trout = TVS
Dissolved Zinc acute and chronic = TVS

Table Value Standards and Hardness Calculations

Standards for metals are generally shown in the regulations as Table Value Standards (TVS), and these often must be derived from equations that depend on the receiving stream hardness or species of fish present; for ammonia, standards are discussed further in Section IV of this WQA. The Classification and Numeric Standards documents for each basin include a specification for appropriate hardness values to be used. Specifically, the regulations state that:

The hardness values used in calculating the appropriate metal standard should be based on the lower 95% confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site-specific data. Where insufficient site-specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not appropriate, a site-specific method should be used.

Metals with standards specified as TVS are not included as parameters of concern for this facility. The only metal the Division will evaluate is Se due to the WLA included in the Gunnison Se TMDL. It should be noted that the Se standards of 4.6 µg/l (ch) and 18.4 µg/l (ac) are not specified as TVS; therefore, the TVS table will not be included in this WQA.

Total Maximum Daily Loads and Regulation 93 – Colorado’s Section 303(d) List of Impaired Waters and Monitoring and Evaluation List

This stream segment is not currently listed on the Division’s 303(d) list of water quality impacted streams and is not on the monitoring and evaluation list. It was delisted in 2012 for the submitted and approved Gunnison Selenium TMDL.

The Division’s Restoration and Protection Unit completed the TMDL in 2011 and therefore the requirements of this TMDL apply for Se. For this permit, the TMDL states that the total WLA for the segment is 0.32 lbs/d based on an individual WLA for Hotchkiss of 0.15 lbs/d. The development of the Hotchkiss WLA was based on a concentration limit of 36.6 µg/L set to protect the water quality standard at the design flow.

IV. Receiving Stream Information**Low Flow Analysis**

The Colorado Regulations specify the use of low flow conditions when establishing water quality based effluent limitations, specifically the acute and chronic low flows. The acute low flow, referred to as 1E3, represents the one-day low flow recurring in a three-year interval, and is used in developing limitations based on an acute standard. The 7-day average low flow, 7E3, represents the seven-day average low flow recurring in a 3 year interval, and is used in developing limitations based on a Maximum Weekly Average Temperature standard (MWAT). The chronic low flow, 30E3, represents the 30-day average low flow recurring in a three-year interval, and is used in developing limitations based on a chronic standard.

The Hotchkiss permit renewal application indicates the facility discharges to the North Fork of the Gunnison River. To determine the low flows available to the Hotchkiss WWTF, USGS gage station 09135950 (Gunnison River below Leroux Creek, Near Hotchkiss, CO) was used. This flow gage provides a representative measurement of upstream flow because it is located immediately upstream of the Hotchkiss facility.

Daily flows from the USGS Gage Station 09135950 were obtained and the annual 1E3 and 30E3 low flows were calculated using EPA DFLOW software. The output from DFLOW provides calculated acute and chronic low flows for each month.

Flow data from March 1, 1999 through May 19, 2009 were available from the gage station. The gage station and time frames were deemed the most accurate and representative of current flows and were therefore used in this analysis.

Based on the low flow analysis described previously, the upstream low flows available to the Hotchkiss WWTF were calculated and are presented in Table A-4.

Table A-4													
Low Flows for the North Fork of the Gunnison River at the Hotchkiss WWTF													
<i>Low Flow (cfs)</i>	<i>Annual</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
1E3 Acute	22	113	94	92	62	204	54	24	22	23	48	92	94
7E3 Chronic	25	113	100	101	103	204	51	26	25	26	48	107	105
30E3 Chronic	29	113	121	134	159	204	54	30	29	29	48	112	112

During the months of January, May, June and October, the acute low flow calculated by DFLOW exceeded the chronic low flow. In accordance with Division standard procedures, the acute low flow was thus set equal to the chronic low flow for these months.

Likewise during the months of January, May and October, the 7E3 low flow exceeded the calculated chronic low flow. The 7E3 was therefore set equal to the chronic low flow for those months.

The ratio of the low flow of the North Fork of the Gunnison River to the Hotchkiss WWTF design flow is 38:1.

Mixing Zones

The amount of the available assimilative capacity (dilution) that may be used by the permittee for the purposes of calculating the WQBELs may be limited in a permitting action based upon a mixing zone analysis or other factor. These other factors that may reduce the amount of assimilative

capacity available in a permit are: presence of other dischargers in the vicinity; the presence of a water diversion downstream of the discharge (in the mixing zone); the need to provide a zone of passage for aquatic life; the likelihood of bioaccumulation of toxins in fish or wildlife; habitat considerations such as fish spawning or nursery areas; the presence of threatened and endangered species; potential for human exposure through drinking water or recreation; the possibility that aquatic life will be attracted to the effluent plume; the potential for adverse effects on groundwater; and the toxicity or persistence of the substance discharged.

Unless a facility has performed a mixing zone study during the course of the previous permit, and a decision has been made regarding the amount of the assimilative capacity that can be used by the facility, the Division assumes that the full assimilative capacity can be allocated. Note that the review of mixing study considerations, exemptions and perhaps performing a new mixing study (due to changes in low flow, change in facility design flow, channel geomorphology or other reason) is evaluated in every permit and permit renewal.

If a mixing zone study has been performed and a decision regarding the amount of available assimilative capacity has been made, the Division may calculate the water quality based effluent limitations (WQBELs) based on this available capacity. In addition, the amount of assimilative capacity may be reduced by T&E implications.

For this facility, 100% of the available assimilative capacity may be used at this time as the facility has not had to perform a mixing zone study, and the discharge is not to a T&E stream segment, and is not expected to have an influence on any of the other factors listed above.

The Hotchkiss discharge is currently located just to the south of the North Fork of the Gunnison River and not directly to the mainstem. The discharge location is approximately ¼ mile to the southeast of the confluence with the mainstem. It appears the discharge may be located within the mixing zone of the North Fork of the Gunnison River as part of the bankfull channel width. Further clarification of the nature of the receiving water is needed to better determine the available assimilative capacity for future permit renewals. If the discharge location is actually part of the floodplain of the River and not within the bankfull channel width, then the full available assimilative capacity of the River may not be utilized. The facility operator described the outfall location as a side overflow channel of the River. The water commissioner described the area below the outfall as a marshy wetland which during the spring would be a gaining reach with springs all around. The Division requests Hotchkiss to study the site to determine if they are discharging to a wetland adjacent to the River, a tributary to the River, or within the bankfull channel width of the River. The Division will reevaluate this issue in the future subsequent to completion of the study.

Ambient Water Quality

The Division evaluates ambient water quality based on a variety of statistical methods as prescribed in Section 31.8(2)(a)(i) and 31.8(2)(b)(i)(B) of the *Colorado Department of Public Health and Environment Water Quality Control Commission Regulation No. 31*, and as outlined in the Division's Policy for Characterizing Ambient Water Quality for Use in Determining Water Quality Standards Based Effluent Limits (WQP-19). Ambient water quality is evaluated in this WQA analysis for use in determining assimilative capacities and in completing antidegradation reviews for pollutants of concern, where applicable.

To conduct an assessment of the ambient water quality upstream of the Hotchkiss WWTF, data were gathered primarily from Riverwatch Stations 269 (East 269), 297 (Above Highway 92 Bridge), and 876 (NF-4A) located on the North Fork of the Gunnison River upstream from the Hotchkiss WWTF. Data were available for a period of record from February 2006 through June 2012. Data from these sources were used to reflect upstream water quality. The most recent five years of data were used where available. A summary of the upstream data from this source is presented in Table A-5. **In addition to Riverwatch data, the Division also included upstream ammonia and *E.coli* data gathered by the Town of Hotchkiss. The Hotchkiss data is also reflected in the summarized Table A-5.**

Table A-5
Ambient Water Quality for the North Fork of the Gunnison River

<i>Parameter</i>	<i>Number of Samples</i>	<i>15th Percentile</i>	<i>50th Percentile</i>	<i>85th Percentile</i>	<i>Mean</i>	<i>Maximum</i>	<i>Chronic Stream Standard</i>	<i>Notes</i>
Temp (°C)	84	1.7	8	16	8.7	21	NA	
DO (mg/l)	90	8.1	10	12	9.8	13	7	
pH (su)	90	8.2	8.3	8.4	8.3	8.9	6.5-9	
<i>E. coli</i> (#/100 ml)	72	1	1	13	3	70	126	1, 2
TRC (mg/l)	0	0	0	0	0	0	0.011	4
Nitrate as N (mg/l)	0	0	0	0	0	0	10	4
Nitrite as N (mg/l)	0	0	0	0	0	0	0.05	4
Nitrate+Nitrite as N (mg/l)	53	0.033	0.079	0.21	0.12	0.53	NA	
Total Inorganic Nitrogen (mg/l)	53	0.04	0.094	0.24	0.13	0.59	NA	
NH3 as N, Tot (mg/l) Jan	8	0.02	0.025	0.05	0.033	0	TVS	
NH3 as N, Tot (mg/l) Feb	9	0.024	0.06	0.52	0.18	0	TVS	
NH3 as N, Tot (mg/l) Mar	10	0.0035	0.035	0.21	0.078	0	TVS	
NH3 as N, Tot (mg/l) Apr	10	0	0.075	0.49	0.18	0	TVS	2
NH3 as N, Tot (mg/l) May	12	0	0.01	0.051	0.032	0	TVS	2
NH3 as N, Tot (mg/l) Jun	10	0	0.04	0.12	0.051	0	TVS	2
NH3 as N, Tot (mg/l) Jul	10	0	0.035	0.16	0.062	0	TVS	2
NH3 as N, Tot (mg/l) Aug	9	0.02	0.03	0.046	0.03	0	TVS	
NH3 as N, Tot (mg/l) Sep	10	0	0.02	0.06	0.026	0	TVS	2
NH3 as N, Tot (mg/l) Oct	9	0	0.04	0.06	0.034	0	TVS	2
NH3 as N, Tot (mg/l) Nov	10	0	0.03	0.047	0.024	0	TVS	2
NH3 as N, Tot (mg/l) Dec	8	0.012	0.045	0.088	0.046	0	TVS	
BOD ₅ (mg/l)	24	0	0	1	0.33	0	NA	2
TSS (mg/l)	24	9.6	21	108	73	0	NA	
TDS (mg/l)	24	283	809	1177	751	0	NA	
As, Dis (µg/l)	57	0	0	0	4.5	54	340	2
Cd, Dis (µg/l)	57	0	0	0.19	0.069	0.8	1.20	2
Cu, Dis (µg/l)	56	0	1.4	3.8	1.8	6.1	28	2
Fe, Dis (µg/l)	57	0	17	30	19	101	300	2
Fe, TR (µg/l)	57	129	294	2401	1358	11020	1000	
Pb, Dis (µg/l)	56	0	0	5.8	1.8	15	10.00	2
Mn, Dis (µg/l)	57	17	55	85	54	112	50	3
Se, Dis (µg/l)	57	0	0	0	0.68	24	4.6	2
Zn, Dis (µg/l)	57	0	0	7.7	3.7	27	388	2
Sulfate (mg/l)	54	61	241	483	251	758	250	3
Hardness as CaCO ₃ (mg/l)	92	134	380	637	380	868	NA	

Note 1: The calculated mean is the geometric mean. Note that for summarization purposes, the value of one was used where there was no detectable amount because the geometric mean cannot be calculated using a value equal to zero.

Note 2: When sample results were below detection levels, the value of zero was used in accordance with the Division's standard approach for summarization and averaging purposes.

Note 3: The ambient water quality exceeds the water quality standards for these parameters.

Note 4: Data was unavailable for these parameters.

V. Facility Information and Pollutants Evaluated

Facility Information

The Hotchkiss WWTF is located in the SW ¼ of the SE ¼ of Section 36, T14S, R93W; south of the North Fork of the Gunnison River, below the confluence with Leroux Creek; at 38.7848° latitude and 107.7348° longitude in Delta County. The current design capacity of the facility is 0.494 MGD (0.76 cfs). In addition, the facility currently has 3 flow tiers for summer ammonia limits. Wastewater treatment is accomplished using aerated lagoons. The technical analyses that follow include assessments of the assimilative capacity based on this design capacity.

An assessment of Division records indicate that there are multiple facilities discharging to the same stream segment or other stream segments immediately upstream or downstream from this facility. Several of these facilities are covered by general permits and have limitations set at the water quality standards. These facilities were not modeled in this WQA as they have a minimal impact on the ambient water quality.

Due to the distance between facilities, the ambient water quality background concentrations used in the mass-balance equation (as described in the following section) account for pollutants of concern contributed by upstream sources, and therefore it was not necessary to account further for upstream sources when calculating available assimilative capacities with the exception of ammonia.

The Town of Paonia WWTF (CO0047431) discharges to the North Fork of the Gunnison River approximately 7.8 miles upstream of the Hotchkiss WWTF; therefore, modeling Paonia in conjunction with Hotchkiss was necessary for ammonia.

Pollutants of Concern

Pollutants of concern may be determined by one or more of the following: facility type; effluent characteristics and chemistry; effluent water quality data; receiving water quality; presence of federal effluent limitation guidelines; or other information. Parameters evaluated in this WQA may or may not appear in a permit with limitations or monitoring requirements, subject to other determinations such as a reasonable potential analysis, mixing zone analyses, 303(d) listings, threatened and endangered species listings or other requirement as discussed in a permit rationale.

There are no site-specific in-stream water quality standards for BOD₅ or CBOD₅, TSS, percent removal, and oil and grease for this receiving stream. Thus, assimilative capacities were not determined for these parameters. The applicable limitations for these pollutants can be found in Regulation No. 62 and will be applied in the permit for the WWTF.

The following parameters were identified by the Division as pollutants to be evaluated for this facility:

- Total Residual Chlorine
- *E. coli*
- Nitrate
- Ammonia

- Temperature
- Se

Based upon the size of the discharge, the lack of industrial contributors, dilution provided by the receiving stream and the fact that no unusually high metals concentrations are expected to be found in the wastewater effluent, metals besides Se are not evaluated further in this water quality assessment.

According to the *Rationale for Classifications, Standards and Designations of the Gunnison River*, stream segment COGUNF03 is designated a water supply because of the presence of six alluvial wells in close proximity to the North Fork of the Gunnison River. One of these wells is located within one and a half miles downstream of the facility. The well (Receipt number 9402357, Permit number 266033A) for domestic use is located 90 feet from the North Fork of the Gunnison, is approximately 35 feet deep with the top of the screen at 14 feet. Thus, the nitrate standard, which is applied at the point of intake to a water supply, is further evaluated as part of this WQA.

During assessment of the facility, nearby facilities, and receiving stream water quality, no additional parameters were identified as pollutants of concern.

The Hotchkiss WWTF currently discharges to stream segment COGUNF03 through Outfall 001B. The facility additionally occasionally discharges to a ditch through Outfall 001A when the ammonia limits are most stringent. The following section details the calculations of WQBELs pertaining to Outfall 001B. Aquatic life based ammonia standards do not apply to ditches; therefore, ammonia WQBELs will not be calculated for Outfall 001A. Technology-based limits will still apply to the discharge to Outfall 001A including *E. coli*, pH, TRC, BOD and TSS.

It should be noted there are two industrial facilities contributing flows to the Hotchkiss WWTF that are categorical industries consisting of a Juice Plant and a Meat Plant. There are currently no pretreatment standards for indirect dischargers for new or existing sources for the Juice or Meat Product categorical industries in accordance with 40CFR407 Subpart A or 40CFR432. Most pollutants of concern associated with these facilities as noted in 40 CFR (BOD, TSS, pH, ammonia, *E.coli*,) are already considered in this WQA analysis. However, nitrate will also be considered as nitrate is a pollutant of concern due to these additional sources. There was no data available on the influent from these plants.

VI. Determination of Water Quality Based Effluent Limitations (WQBELs)

Technical Information

Note that the WQBELs developed in the following paragraphs, are calculations of what an effluent limitation may be in a permit. The WQBELs for any given parameter, will be compared to other potential limitations (federal effluent limitations guidelines, state effluent limitations, or other applicable limitation) and typically the more stringent limit is incorporated into a permit. If the WQBEL is the more stringent limitation, incorporation into a permit is dependent upon a reasonable potential analysis.

In-stream background data and low flows evaluated in Section IV are used to determine the assimilative capacity of the North Fork of the Gunnison River near the Hotchkiss WWTF for pollutants of concern, and to calculate the WQBELs. For all parameters except ammonia, it is the Division's approach to calculate the WQBELs using the lowest of the monthly low flows (referred to as the annual low flow) as determined in the low flow analysis. For ammonia, it is the standard procedure of the Division to determine monthly WQBELs using the monthly low flows, as the regulations allow the use of seasonal flows.

The Division's standard analysis consists of steady-state, mass-balance calculations for most pollutants and modeling for pollutants such as ammonia. The mass-balance equation is used by the Division to calculate the WQBELs, and accounts for the upstream concentration of a pollutant at the existing quality, critical low flow (minimal dilution), effluent flow and the water quality standard. The mass-balance equation is expressed as:

$$M_2 = \frac{M_3Q_3 - M_1Q_1}{Q_2}$$

Where,

Q_1 = Upstream low flow (1E3 or 30E3)

Q_2 = Average daily effluent flow (design capacity)

Q_3 = Downstream flow ($Q_1 + Q_2$)

M_1 = In-stream background pollutant concentrations at the existing quality

M_2 = Calculated WQBEL

M_3 = Water Quality Standard, or other maximum allowable pollutant concentration

The upstream background pollutant concentrations used in the mass-balance equation will vary based on the regulatory definition of existing ambient water quality. For most pollutants, existing quality is determined to be the 85th percentile. For metals in the total or total recoverable form, existing quality is determined to be the 50th percentile. For pathogens such as fecal coliform and *E. coli*, existing quality is determined to be the geometric mean.

For temperature, the highest 7-day mean (for the chronic standard) of daily average stream temperature, over a seven consecutive day period will be used in calculations of the chronic temperature assimilative capacity, where the daily average temperature should be calculated from a minimum of three measurements spaced equally through the day. The highest 2-hour mean (for the acute standard) of stream temperature will be used in calculations of the acute temperature assimilative capacity. The highest 2-hour mean should be calculated from a minimum of 12 measurements spaced equally through the day.

Calculation of WQBELs

Using the mass-balance equation provided in the beginning of Section VI, the acute and chronic low flows set out in Section IV, ambient water quality as discussed in Section IV, and the in-stream standards shown in Section III, the WQBELs were calculated. The data used and the resulting WQBELs, M_2 , are set forth in Table A-6a for the chronic WQBELs and A-6b for the acute WQBELs.

Chlorine: There are no point sources discharging total residual chlorine within one mile of the Hotchkiss WWTF. Because chlorine is rapidly oxidized, in-stream levels of residual chlorine are detected only for a short distance below a source. Ambient chlorine was therefore assumed to be zero.

***E. coli*:** There are no point sources discharging *E. coli* within one mile of the Hotchkiss WWTF. Thus, WQBELs were evaluated separately. For *E. coli*, the Division establishes the 7-day geometric mean limit as two times the 30-day geometric mean limit and also includes maximum limits of 2,000 colonies per 100 ml (30-day geometric mean) and 4,000 colonies per 100 ml (7-day geometric mean). This 2000 colony limitation also applies to discharges to ditches.

Temperature: Based on the Division's Temperature Policy, WQP-23, domestic WWTF with a ratio of the 7E3 annual low flow to the permitted flow of greater than 10:1 is excluded from temperature limitations. The 7E3 low flow is 25 cfs resulting in a dilution ratio (7E3 low flow to effluent) of 33:1; therefore, no temperature limitations are required.

Nitrate / Total Inorganic Nitrogen (T.I.N.): An acute nitrate standard of 10 mg/l is assigned to this segment, and is intended to be applied at the nearest downstream water intake, which is located within one and a half miles downstream from the Hotchkiss WWTF. Because nitrite and ammonia can also form nitrate, compliance with the nitrate standard is achieved through imposition of a Total Inorganic Nitrogen (T.I.N.) limit of 10 mg/l. T.I.N. effectively measures nitrate and its precursors including nitrite and ammonia.

The low flow values calculated from the USGS Station 09135950 and ambient water quality from the Riverwatch stations are the appropriate data sources for the TIN analysis.

To determine the background concentration for Total Inorganic Nitrogen for use in the mass balance equation, same day samples of the ambient data for ammonia, nitrite and nitrate (or nitrite + nitrate) were added together to calculate the T.I.N. The 85th percentile of this summed data was calculated as 0.239 mg/L and used as the ambient water quality for T.I.N.

Selenium: The Gunnison Se TMDL contains a WLA for the Hotchkiss and Paonia WWTFs for chronic Se of 0.32 pounds per day (lbs/d). This allocation is the total of the WLA for Hotchkiss of 0.15 lbs/d and Paonia of 0.17 lbs/d based on the facility design flows (0.494 MGD Hotchkiss and 0.495 MGD Paonia). The facilities WLAs were calculated from WQBELs converted to loads by multiplying by the facilities' design flows. The development of the WQBEL is standard practice to ensure compliance with the Water Quality Standards (WQSs) in the receiving stream. The chronic Se WQBEL for Hotchkiss was 36.6 µg/l. WLAs are implemented in permits. The TMDL did not

include an assessment for acute Se. In order to determine the reasonable potential for Se in the Hotchkiss WWTF effluent, sampling must be performed.

The currently calculated QBEL for chronic Se at design capacity is 180 µg/L which is less stringent than the TMDL WLA of 36.6 µg/L. The acute QBEL for Se at design capacity is currently calculated as 551 µg/L.

Table A-6a							
Chronic QBELs							
Parameter	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	M_1	M_3	M_2	Notes
<i>E.coli</i> , (#/100ml) Apr-Sep	29	0.76	29.76	3	126	4819	
<i>E.coli</i> , (#/100ml) Oct-Mar	29	0.76	29.76	3	205	7912	
TRC (mg/l)	29	0.76	29.76	0	0.011	0.43	
Se, Dis (µg/l)	NA	NA	NA	NA	NA	36.6	1
Note 1: The Se QBEL was determined during the Gunnison TMDL analysis to be 36.6 µg/L with a WLA of 0.15 lbs/day. Note the WLA is still protective of current water quality as the current calculated QBEL of 551 µg/L is higher than 36.6 µg/L.							

Table A-6b							
Acute QBELs							
Parameter	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	M_1	M_3	M_2	Notes
<i>E.coli</i> , (#/100ml) Apr-Sep						9639	1
<i>E.coli</i> , (#/100ml) Oct-Mar						15826	1
TRC (mg/l)	22	0.76	22.76	0	0.019	0.57	
Nitrate as N (mg/l)	22	0.76	22.76	0	10	NA	2
Nitrite as N (mg/l)	22	0.76	22.76	0	0.05	NA	2
Nitrate+Nitrite as N (mg/l)	22	0.76	22.76	0.21	NA	NA	2
Total Inorganic Nitrogen (mg/l)	22	0.76	22.76	0.24	10	293	2
Se, Dis (µg/l)	22	0.76	22.76	0	18.4	551	3
Note 1: The acute <i>E.coli</i> limit is calculated at 2 times the chronic limit.							
Note 2: Compliance with the nitrate standard is achieved through imposition of a T.I.N. limit of 10 mg/l. The other N parameters are provided for informational purposes.							
Note 3: The Gunnison Se TMDL analysis did not include acute WLAs. The current acute QBEL at design capacity is provided here.							

Ammonia: The Ammonia Toxicity Model (AMMTOX) is a software program designed to project the downstream effects of ammonia and the ammonia assimilative capacities available to each discharger based on upstream water quality and effluent discharges. To develop data for the AMMTOX model, an in-stream water quality study should be conducted of the upstream receiving water conditions, particularly the pH and corresponding temperature, over a period of at least one year.

Due to the close proximity of Hotchkiss and Paonia WWTFs (7.8 miles), the two facilities were modeled together for ammonia. Ammonia, temperature and corresponding pH data sets reflecting upstream ambient receiving water conditions were available for the North Fork of the Gunnison River based on data assessed from Riverwatch Station 238. The data, reflecting a period of record from April 2007 through April 2012, were used to establish the average headwater conditions in the AMMTOX model. Effluent pH data were also available from the Paonia and Hotchkiss DMRs and were used to establish the average facility contributions in the AMMTOX model. Effluent temperature data was not available; therefore, default temperature values for Paonia and Hotchkiss were taken from AMMTOX documentation files. Adequate downstream paired pH and temperature data were not available in order to calculate setpoint conditions; therefore, conservative assumptions of 9 pH and 20 degrees C were used.

The mean total ammonia concentration found in the North Fork of the Gunnison River as summarized in Table A-5 was used as an applicable upstream ammonia concentration reflective of each month.

The AMMTOX may be calibrated for a number of variables in addition to the data discussed above. The values used for the other variables in the model are listed below:

- Stream velocity = $0.3Q^{0.4d}$
- Default ammonia loss rate = 6/day
- pH amplitude was assumed to be medium
- Default times for pH maximum, temperature maximum, and time of day of occurrence
- pH rebound was set at the default value of 0.2 su per mile
- Temperature rebound was set at the default value of 0.7 degrees C per mile.

Consistent with the previous permit analysis for the North Fork (PEL development for Paonia) and in order to better represent site conditions including the multiple return flows to the River, the seepage rate in AMMTOX was set to 2.5 cfs/mile along with an ammonia concentration of 0.01 mg/L.

Ammonia limitations for the Hotchkiss and Paonia WWTFs were set equally for the analyses at facility design capacities. The Hotchkiss WWTF is not foreseen to have any compliance issues with the ammonia assimilative capacities calculated.

The results of the ammonia analyses for the Hotchkiss 001B outfall are presented in Table A-7.

Table A-7 AMMTOX Results for the North Fork of the Gunnison River at the Hotchkiss and Paonia WWTFs		
<i>Design of 0.494 MGD (0.76 cfs)</i>		
<i>Month</i>	<i>Total Ammonia Chronic (mg/l)</i>	<i>Total Ammonia Acute (mg/l)</i>
January	26	40
February	26	40
March	23	40
April	40	40
May	19	35
June	15	30
July	13	33
August	14	34
September	14	32
October	16	28
November	25	40
December	26	38

VII. Antidegradation Evaluation

As set out in *The Basic Standards and Methodologies for Surface Water*, Section 31.8(2)(b), an antidegradation analysis is required except in cases where the receiving water is designated as “Use Protected.” Note that “Use Protected” waters are waters “that the Commission has determined do not warrant the special protection provided by the outstanding waters designation or the antidegradation review process” as set out in Section 31.8(2)(b). The antidegradation section of the regulation became effective in December 2000, and therefore antidegradation considerations are applicable to this WQA analysis.

According to the *Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins*, stream segment COGUNF03 is undesignated. Thus, an antidegradation review is required for this segment if new or increased impacts are found to occur. The review will evaluate impacts from discharges from Outfall 001B on the North Fork of the Gunnison. Discharges from Outfall 001A are to a ditch where antidegradation does not apply.

Introduction to the Antidegradation Process

The antidegradation process conducted as part of this water quality assessment is designed to determine if an antidegradation review is necessary and if necessary, to complete the required calculations to determine the limits that can be selected as the antidegradation-based effluent limit (ADBEL), absent further analyses that must be conducted by the facility.

As outlined in the *Antidegradation Significance Determination for New or Increased Water Quality Impacts, Procedural Guidance* (AD Guidance), the first consideration of an antidegradation evaluation is to determine if new or increased impacts are expected to occur. This is determined by a comparison of the newly calculated WQBELs versus the existing permit limitations in place as of September 30, 2000, and is described in more detail in the analysis. Note that the AD Guidance refers to the permit limitations as of September 30, 2000 as the existing limits.

If a new or increased impact is found to occur, then the next step of the antidegradation process is to go through the significance determination tests. These tests include: 1) bioaccumulative toxic pollutant test; 2) temporary impacts test; 3) dilution test (100:1 dilution at low flow) and; 4) a concentration test.

As the determination of new or increased impacts, and the bioaccumulative and concentration significance determination tests require more extensive calculations, the Division will begin the antidegradation evaluation with the dilution and temporary impact significance determination tests. These two significance tests may exempt a facility from further AD review without the additional calculations.

Note that the antidegradation requirements outlined in *The Basic Standards and Methodologies for Surface Water* specify that chronic numeric standards should be used in the antidegradation review; however, where there is only an acute standard, the acute standard should be used. The appropriate standards are used in the following antidegradation analysis.

Significance Tests for Temporary Impacts and Dilution

This is not a temporary discharge and therefore exclusion based on a temporary discharge cannot be granted and the AD evaluation must continue.

The ratio of the chronic (30E3) low flow to the design flow is 38:1, and is less than the 100:1 significance criteria. Therefore this facility is not exempt from an AD evaluation based on the dilution significance determination test, and the AD evaluation must continue.

For the determination of a new or increased impact and for the remaining significance determination tests, additional calculations are necessary. Therefore, at this point in the antidegradation evaluation, the Division will go back to the new or increased impacts test. If there is a new or increased impact, the last two significance tests will be evaluated.

New or Increased Impact and Non Impact Limitations (NILs)

To determine if there is a new or increased impact to the receiving water, a comparison of the new WQBEL concentrations and loadings versus the concentrations and loadings as of September 30, 2000, needs to occur. If either the new concentration or loading is greater than the September 2000 concentration or loading, then a new or increased impact is determined. If this is a new facility (commencement of discharge after September 30, 2000) it is automatically considered a new or increased impact.

Note that the AD Guidance document includes a step in the New or Increased Impact Test that calculates the Non-Impact Limit (NIL). The permittee may choose to retain a NIL if certain conditions are met, and therefore the AD evaluation for that parameter would be complete. As the NIL is typically greater than the antidegradation based average concentration (ADBAC), and is therefore the chosen limit, the Division will typically conclude the AD evaluation after determining the NIL. Where the NILs are very stringent, or upon request of a permittee, the Division will calculate both the NIL and the AD limitation so that the limitations can be compared and the permittee can determine which of the two limits they would prefer, one which does not allow any increased impact (NIL), or the other which allows an insignificant impact (AD limit).

The NIL is defined as the limit which results in no increased water quality impact (no increase in load or limit over the September 2000 load or limit). The NIL is calculated as the September 2000 loading, divided by the new design flow, and divided by a conversion factor of 8.34. If there is no change in design flow, then the NIL is equal to the September 2000 permit limitation otherwise known as the Existing Limit.

If the facility was in place, but did not have a limitation for a particular parameter in the September 2000 permit, the Division may substitute an implicit limitation. Consistent with the First Update to the AD Guidance of April 2002, an implicit limit is determined based on the approach that specifies that the implicit limit is the maximum concentration of the effluent from October 1998 to September 2000, if such data is available. If this data is unavailable, the Division may substitute more recent representative data, if appropriate, on a case by case basis. Note that if there is a change in design flow, the implicit limit/loading is subject to recalculation based on the new design flow. For parameters that are undisclosed by the permittee, and unknown to the Division to be present, an implicit limitation may not be recognized.

This facility was in place as a discharger prior to September 30, 2000, and therefore the new or increased impacts test must be conducted. As the design flow for this facility is the same as it was in September 2000, the NILs are equal to the permit limitations as of September 2000.

Existing Limits

The Hotchkiss WWTF had existing limits for fecal coliform, TRC and total ammonia.

Implicit Limits

An implicit limit for T.I.N. is difficult to determine due to lack of effluent data available; therefore, the Division will include monitoring requirements in the permit so that data can be collected in order to make such a determination of an implicit limit.

In accordance with the Division's practice regarding *E. coli*, an implicit limit for *E. coli* is determined as 0.32 times the permit limit for fecal coliform.

Calculation of Loadings for New or Increased Impact Test

The equations for the loading calculations are given below. Note that the AD requirements outlined in *The Basic Standards and Methodologies for Surface Water* specify that chronic numeric standards should be used in the AD review; however, where there is only an acute standard, the acute standard should be used. Thus, the chronic low flows will be used later in this AD evaluation for all parameters with a chronic standard, and the acute low flows will be used for those parameters with only an acute standard.

$$\begin{aligned} \text{Previous permit load} &= M_{\text{permitted}} (\text{mg/l}) \times Q_{\text{permitted}} (\text{mgd}) \times 8.34 \\ \text{New WQBELs load} &= M_2 (\text{mg/l}) \times Q_2 (\text{mgd}) \times 8.34 \end{aligned}$$

Where,

$M_{\text{permitted}}$	= September 2000 permit limit (or implicit limit) (mg/l)
$Q_{\text{permitted}}$	= design flow as of September 2000 (mgd)
Q_2	= current design flow (same as used in the WQBEL calculations)
M_2	= new WQBEL concentration (mg/l)
8.34	= unit conversion factor

Table A-8 shows the results of these calculations and the determination of a new or increased impact.

Calculation of Non-Impact Limitations

Since the design flow of this facility has not changed since September 30, 2000, the calculation of NILs is unnecessary. In accordance with the AD Guidance, New or increased impacts will be evaluated by comparing the new WQBEL with the September 2000 existing or implicit limit.

Table A-8 shows the results of these calculations and the determination of a new or increased impact.

Table A-8 Determination of New or Increased Impacts						
<i>Pollutant</i>	<i>Sept 2000 Permit Limit</i>	<i>Sept 2000 Permit Load (lbs/day)</i>	<i>NIL</i>	<i>New WQBEL</i>	<i>New WQBEL Load (lbs/day)</i>	<i>New or Increased Impact</i>
<i>E. coli</i> (#/100 ml)	1920	7910	NA	4835	19920	Yes
TRC (mg/l)	0.5	2.1	NA	0.43	1.8	No
Total Inorganic Nitrogen (mg/l)	NA	NA	NA	293	1207	Yes
NH ₃ , Tot (mg/l) Jan	30	124	NA	26	107	No
NH ₃ , Tot (mg/l) Feb	30	124	NA	26	107	No
NH ₃ , Tot (mg/l) Mar	25	103	NA	23	95	No
NH ₃ , Tot (mg/l) Apr	25	103	NA	40	165	Yes
NH ₃ , Tot (mg/l) May	15	62	NA	19	78	Yes
NH ₃ , Tot (mg/l) Jun	7	29	NA	15	62	Yes
NH ₃ , Tot (mg/l) Jul	7	29	NA	13	54	Yes
NH ₃ , Tot (mg/l) Aug	7	29	NA	14	58	Yes
NH ₃ , Tot (mg/l) Sep	8.5	35	NA	14	58	Yes
NH ₃ , Tot (mg/l) Oct	11	45	NA	16	66	Yes
NH ₃ , Tot (mg/l) Nov	15	62	NA	25	103	Yes
NH ₃ , Tot (mg/l) Dec	30	124	NA	26	107	No
Se, Dis (µg/l)	NA	NA	NA	36.6	0.15	Yes
Note that loading for <i>E. coli</i> cannot be calculated; but, for comparison purposes, the approach is sufficient. An implied 2000 permit limit for <i>E. coli</i> is calculated as .32 times the fecal coliform 2000 limit of 6000 #/100ml. * Se included since WLA in TMDL for Hotchkiss of 0.15 lbs/day.						

As shown in Table A-8, there are no new or increased impacts to the receiving stream based on the new WQBELS for TRC and total ammonia during the months of January, February, March and December; and for these parameters the AD evaluation is complete and the WQBELS are the final result of this WQA.

For *E. coli* and total ammonia during the months of April through November there are new or increased impacts and in accordance with regulation, the permittee has the option of choosing either the September 2000 limits (NILs) or ADBAC's. Because the ADBAC's are generally more stringent than the NILs, the Division assumes that the permittee will choose the NILs rather than ADBAC's, and therefore the Division will stop the AD evaluation at this point and assign the NILs to the permit. For those parameters where there is not an existing limit (either implicit or explicit) the AD Guidance allows for the collection of data to determine an implicit limitation. Therefore, the permittee will be required to conduct "monitoring only" for those parameters. The permittee may request ADBAC limits. If the permittee does request ADBAC limits, the Division will proceed with the completion of this Antidegradation Analysis.

The end results of this AD evaluation are in Table A-9, including any parameter that was previously exempted from further AD evaluation, with the final potential limitation identified (Existing Limit or WQBEL).

Table A-9 Final Selection of WQBELs or Existing Limits			
<i>Pollutant</i>	<i>Sept 2000 Permit Limit</i>	<i>New WQBEL</i>	<i>Chosen Limit</i>
<i>E. coli</i> (#/100 ml)	1920	4835	Existing Limit
TRC (mg/l)	0.5	0.43	WQBEL
Total Inorganic Nitrogen (mg/l)	NA	293	WQBEL
NH ₃ as N, Tot (mg/l) Jan	30	26	WQBEL
NH ₃ as N, Tot (mg/l) Feb	30	26	WQBEL
NH ₃ as N, Tot (mg/l) Mar	25	23	WQBEL
NH ₃ as N, Tot (mg/l) Apr	25	40	Existing Limit
NH ₃ as N, Tot (mg/l) May	15	19	Existing Limit
NH ₃ as N, Tot (mg/l) Jun	7	15	Existing Limit
NH ₃ as N, Tot (mg/l) Jul	7	13	Existing Limit
NH ₃ as N, Tot (mg/l) Aug	7	14	Existing Limit
NH ₃ as N, Tot (mg/l) Sep	8.5	14	Existing Limit
NH ₃ as N, Tot (mg/l) Oct	11	16	Existing Limit
NH ₃ as N, Tot (mg/l) Nov	15	25	Existing Limit
NH ₃ as N, Tot (mg/l) Dec	30	26	WQBEL
Se, Dis (µg/l)	NA	36.6	TMDL based on 36.6 µg/L
An implied 2000 permit limit for <i>E.coli</i> is calculated as .32 times the fecal coliform 2000 limit of 6000 #/100ml.			

For the following parameters, *E.coli* and total ammonia for the months of April through November, the Existing Limits have been established for this facility. The Existing Limits were selected as they are less stringent than the ADBACs. However, the facility has the final choice between the Existing Limits and ADBACs, and if the ADBAC is preferred, the permit writer should be contacted.

Ammonia Flow Tiers:

The Hotchkiss WWTF current permit includes varied tiered flow limits for total ammonia during the months of June through October. The June, July and August flow tiers include 0 to 0.230 MGD, 0.230 to 0.288 MGD, and 0.288 to 0.494 MGD (design capacity). September flow tiers include 0 to 0.263 MGD, 0.263 to 0.329 MGD, and 0.329 to 0.494 MGD (design capacity). October flow tiers include 0 to 0.362 MGD, 0.362 to 0.453 MGD, and 0.453 to 0.494 MGD (design capacity).

Review of the Hotchkiss Discharge Monitoring Reports (DMRs) indicate the facility would not need the flow tiers to meet the WQBELs; however, they may need tiered limits to meet the antidegradation based limits in the summer months. In this case, the antidegradation based non-

impact limits (Existing Limits) selected with associated flow tiers will continue in the next permit cycle as indicated in Table A-10.

Flow-tiered limits have been included in the Hotchkiss permit since 1997. Due to the complicating factor of establishing antidegradation based Existing Limits as of September 30, 2000 with tiered flows, the Division will continue to use the previous permit flow tiers and associated concentration limits. The limits are protective of remaining assimilative capacity in the North Fork of the Gunnison River.

The previous permit flow tiers were determined at the request of the Town of Hotchkiss for concentrations of 12 and 15 mg/L total ammonia during the summer months. Flow rates associated with those fixed concentrations were then required to be determined. The mass loading based on the non-impact limit (7 mg/L for most months below in Table A-10) and the design capacity was calculated for each month. The flow rates were then back calculated from the monthly mass loading and the fixed concentrations. The numbers in **bold** type in Table A-10 were calculated.

As described above, the Division continued the inclusion of this approach and limits from the previous permit to ensure consistency. The flow tiered limits were run through AMMTOX to verify they would be protective of water quality.

Table A-10 Loading Calculations for Flow Tiered Total Ammonia Limits			
<i>Month</i>	<i>Total Ammonia (mg/l)</i>	<i>Flow Rate (MGD)</i>	<i>Mass Loading (lbs/d)</i>
June	7	0.494	28.84
	12	0.288	28.84
	15	0.231	28.84
July	7	0.494	28.84
	12	0.288	28.84
	15	0.231	28.84
August	7	0.494	28.84
	12	0.288	28.84
	15	0.231	28.84
September	8	0.494	32.96
	12	0.329	32.96
	15	0.263	32.96
October	11	0.494	45.32
	12	0.453	45.32
	15	0.362	45.32

Alternatives Analysis

If the permittee does not want to accept an effluent limitation that results in no increased impact (Exiting Limit or NIL) or in insignificant degradation (ADBAC), the applicant may conduct an alternatives analysis (AA). The AA examines alternatives that may result in no degradation or less degradation, and are economically, environmentally, and technologically reasonable. If the proposed activity is determined to be important economic or social development, a determination shall be made whether the degradation that would result from such regulated activity is necessary to accommodate that development. The result of an AA may be an alternate limitation between the ADBAC and the WQBEL, and set as the ADBEL. This option can be further explored with the Division. See Regulation 31.8 (3)(d), and the AD Guidance for more information regarding an alternatives analysis.

VIII. Technology Based Limitations

Federal Effluent Limitation Guidelines

The Federal Effluent Limitation Guidelines for domestic wastewater treatment facilities are the secondary treatment standards. These standards have been adopted into, and are applied out of, Regulation 62, the Regulations for Effluent Limitations.

Regulations for Effluent Limitations

Regulation No. 62, the Regulations for Effluent Limitations, includes effluent limitations that apply to all discharges of wastewater to State waters, with the exception of storm water and agricultural return flows. These regulations are applicable to the discharge from the proposed discharge.

Table A-11 contains a summary of the applicable limitations for pollutants of concern at this facility.

Table A-11			
Regulation 62 Based Limitations			
<i>Parameter</i>	<i>30-Day Average</i>	<i>7-Day Average</i>	<i>Instantaneous Maximum</i>
BOD ₅	30 mg/l	45 mg/l	NA
BOD ₅ Percent Removal	85%	NA	NA
TSS, aerated lagoon	75 mg/l	110 mg/l	NA
Total Residual Chlorine	NA	NA	0.5 mg/l
pH	NA	NA	6.0-9.0 s.u.
Oil and Grease	NA	NA	10 mg/l

IX. References

Regulations:

The Basic Standards and Methodologies for Surface Water, Regulation 31, Colorado Department Public Health and Environment, Water Quality Control Commission, effective January 31, 2013.

Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins, Regulation No. 35, Colorado Department Public Health and Environment, Water Quality Control Commission, effective March 1, 2013.

Colorado River Salinity Standards, Regulation 39, CDPHE, WQCC (last update effective 8/30/97).

Regulations for Effluent Limitations, Regulation 62, CDPHE, WQCC, July 30, 2012.

Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List, Regulation 93, Colorado Department Public Health and Environment, Water Quality Control Commission, effective March 30, 2012.

Policy and Guidance Documents:

Antidegradation Significance Determination for New or Increased Water Quality Impacts, Procedural Guidance, Colorado Department Public Health and Environment, Water Quality Control Division, December 2001.

Memorandum Re: First Update to (Antidegradation) Guidance Version 1.0, Colorado Department Public Health and Environment, Water Quality Control Division, April 23, 2002.

Rationale for Classifications, Standards and Designations of Segments of the Gunnison River, Colorado Department Public Health and Environment, Water Quality Control Division, effective June 13, 2012.

Policy Concerning Escherichia coli versus Fecal Coliform, CDPHE, WQCD, July 20, 2005.

Colorado Mixing Zone Implementation Guidance, Colorado Department Public Health and Environment, Water Quality Control Division, effective April 2002.

Policy for Conducting Assessments for Implementation of Temperature Standards in Discharge Permits, Colorado Department Public Health and Environment, Water Quality Control Division Policy Number WQP-23, effective July 3, 2008.

Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops, Colorado Department Public Health and Environment, Water Quality Control Division Policy Number WQP-24, effective March 10, 2008.

Policy for Characterizing Ambient Water Quality for Use in Determining Water Quality Standards Based Effluent Limits, Colorado Department Public Health and Environment, Water Quality Control Division Policy Number WQP-19, effective May 2002.

Other:

Total Maximum Daily Load Assessment, Gunnison River and Tributaries, Uncompahgre River and Tributaries, Delta/Mesa/Montrose Counties, Colorado, Colorado Department of Public Health and Environment, Water Quality Control Division, January, 2011